

Biotinylated peptides then can be incubated with avidin or streptavidin to create large complexes. The molecular mass of such polymers can be regulated through careful control of the molar ratio of biotinylated peptide to avidin or streptavidin.

Also provided by this application are the peptides and polypeptides described
5 herein conjugated to a detectable agent for use in the diagnostic methods. For example, detectably labeled peptides and polypeptides can be bound to a column and used for the detection and purification of antibodies. They also are useful as immunogens for the production of antibodies, as described below.

The peptides of this invention also can be combined with various liquid phase
10 carriers, such as sterile or aqueous solutions, pharmaceutically acceptable carriers, suspensions and emulsions. Examples of non-aqueous solvents include propyl ethylene glycol, polyethylene glycol and vegetable oils. When used to prepare antibodies, the carriers also can include an adjuvant that is useful to non-specifically augment a specific immune response. A skilled artisan can easily determine whether an adjuvant
15 is required and select one. However, for the purpose of illustration only, suitable adjuvants include, but are not limited to, Freund's Complete and Incomplete, mineral salts and polynucleotides.

This invention further provides polynucleotides encoding polypeptides comprising the sequences FLQLLMEPV (SEQ ID NO:3), FLQLEFDAV (SEQ ID
20 NO:5), FLWFEIDIV (SEQ ID NO:7), FLSYDLFVV (SEQ ID NO:9) and NLQLLMDRV (SEQ ID NO:11) and the complements of these polynucleotides. As used herein, the term "polynucleotide" encompasses DNA, RNA and nucleic acid mimetics. In addition to these polynucleotides, or their complements, this invention also provides the anti-sense polynucleotide stand, *e.g.* antisense RNA to the sequences
25 or their complements. One can obtain an antisense RNA using the sequences provided in SEQ ID NOS. 4, 6, 8, 10 12 and 14, and the methodology described in Van der Krol, et al. (1988) BioTechniques 6:958.

The polynucleotides of this invention can be replicated using PCR. PCR technology is the subject matter of United States Patent Nos. 4,683,195; 4,800,159;
30 4,754,065; and 4,683,202 and described in PCR: THE POLYMERASE CHAIN REACTION (Mullis et al. eds, Birkhauser Press, Boston (1994)) and references cited therein.